

GIBBONS 4-3

CLAIMS

What is claimed is:

1 1. In a wireless communications network, a method in a base station to communicate
2 with a remote unit that is in a sleep mode, the remote unit having a unique identification value,
3 comprising the steps of:

4
5 establishing a periodic reference instant at the base station and at the remote station;

6
7 determining a delay interval following said periodic reference instant at the base station,
8 said delay interval being derived from said unique identification value of said remote unit; and

9
10 transmitting a message from the base station to the remote unit at a second instant
11 following said delay interval, said remote unit having changed from said sleep mode to a
12 standby mode after said delay interval.

1 2. The method of claim 1, wherein said base station is part of a wireless discrete
2 multitone spread spectrum communications system.

GIBBONS 4-3

1 3. The method of claim 1, wherein said periodic reference instant is established by a
2 beginning subframe count instant that is incremented by a packet count value at the base station
3 and at the remote unit.

1 4. The method of claim 3, wherein said delay interval is determined by a value N of a
2 quantity of M least significant bits of said unique identification value of said remote unit, the
3 delay interval being an interval required for the occurrence of a plurality of N of said
4 beginning subframe count instants.

1 5. The method of claim 4, wherein said remote unit changes from said sleep mode to a
2 standby mode after said delay interval.

GIBBONS 4-3

1 6. In a wireless communications network, a method in a base station to communicate
2 with a remote unit that is in a sleep mode, the remote unit having a unique identification value,
3 comprising the steps of:

4
5 establishing a periodic reference instant at the base station and at the remote station;

6
7 determining a delay interval following said periodic reference instant at the base station,
8 said delay interval being derived from said unique identification value of said remote unit;

9
10 attempting to initiate a communication from said base station to said remote unit;

11
12 concluding at the base station that the remote unit is in a sleep mode if said attempting
13 step fails to initiate communications with the remote unit;

14
15 waiting for said delay interval following said periodic reference instant at the base
16 station; and

17
18 transmitting a message from the base station to the remote unit at a second instant
19 following said delay interval, said remote unit having changed from said sleep mode to a
20 standby mode after said delay interval.

GIBBONS 4-3

1 7. The method of claim 6, wherein said base station is part of a wireless discrete
2 multitone spread spectrum communications system.

1 8. The method of claim 6, wherein said periodic reference instant is established by a
2 beginning subframe count instant that is incremented by a packet count value at the base station
3 and at the remote unit.

1 9. The method of claim 8, wherein said delay interval is determined by a value N of a
2 quantity of M least significant bits of said unique identification value of said remote unit, the
3 delay interval being an interval required for the occurrence of a plurality of N of said
4 beginning subframe count instants.

1 10. The method of claim 9, wherein said remote unit changes from said sleep mode to a
2 standby mode after said delay interval.

GIBBONS 4-3

1 11. A highly bandwidth-efficient communications method in a base station to
2 communicate with a remote unit that is in a sleep mode, the remote unit having a unique
3 identification value, comprising the steps of:
4
5 establishing a periodic reference instant at the base station and at the remote station;
6
7 determining a delay interval following said periodic reference instant at the base station,
8 said delay interval being derived from said unique identification value of said remote unit;
9
10 receiving at a base station a spread signal comprising an incoming data traffic signal
11 spread over a plurality of discrete traffic frequencies;
12
13 adaptively despread the signals received at the base station by using despread
14 weights;
15
16 attempting to initiate a communication from said base station to said remote unit;
17
18 concluding at the base station that the remote unit is in a sleep mode if said attempting
19 step fails to initiate communications with the remote unit;
20
21 waiting for said delay interval following said periodic reference instant at the base

GIBBONS 4-3

station; and

transmitting at the base station to the remote unit a spread signal comprising an outgoing data traffic signal spread over a plurality of discrete traffic frequencies.

12. The method of claim 11, wherein said base station is part of a wireless discrete multitone spread spectrum communications system.

13. The method of claim 11, wherein said periodic reference instant is established by a beginning subframe count instant that is incremented by a packet count value at the base station and at the remote unit.

14. The method of claim 13, wherein said delay interval is determined by a value N of a quantity of M least significant bits of said unique identification value of said remote unit, the delay interval being an interval required for the occurrence of a plurality of N of said beginning subframe count instants.

15. The method of claim 14, wherein said remote unit changes from said sleep mode to a standby mode after said delay interval.

1 16. A remote unit for a personal wireless area network comprising:

2 a receiver;

3 an AC power supply coupled to the receiver and supplying power to the

4 receiver;

5 a battery-backup power supply coupled to the receiver, the battery-backup

6 power supply becoming operative to supply power to the receiver when the AC power supply

7 fails; and

8 a controller coupled to the receiver, the AC power supply and the battery-

9 backup power supply, the controller detecting when the AC power supply fails and in response

10 controls the receiver and the battery-backup power supply by invoking a sleep mode of

11 operation, the sleep mode operation being periodically interrupted by the controller controlling

12 the receiver and the battery-backup power supply to enter a standby mode of operation in

13 which the receiver scans for a CONNECT message indicating an incoming call, the controller

14 controlling the sleep mode and the standby mode of operations based on a frame count that is

15 generated from an identification number of the remote unit.

16
17 17. The remote unit according to claim 16, wherein the receiver scans for a connect

18 message for a predetermined number of subframes of a TDD timing structure.

1 18. The remote unit according to claim 17, wherein the predetermined number of

GIBBONS 4-3

2 subframes equals 3.

1 19. The remote unit according to claim 17, wherein when the remote unit enters the
2 standby mode, the remote unit reacquires synchronization to the TDD timing structure.

1 20. The remote unit according to claim 19, wherein the remote unit reacquires
2 synchronization to the TDD timing structure in about 34 subframes.

1 21. The remote unit according to claim 19, wherein the remote unit scans for a
2 CONNECT message at a subframe that is related to an identification number of the remote
3 unit.

1 22. A method for reducing power consumption of a remote unit in a PWAN system,
2 comprising the steps of:

3 powering a remote unit using a battery backup power supply when an AC power
4 supply fails at the remote unit;

5 entering a sleep mode of operation at the remote unit, the sleep mode having a
6 reduced power consumption for the battery backup power supply;

7 entering a standby mode of operation at the remote unit a predetermined period
8 of time after entering the sleep mode of operation

9 scanning for a CONNECT message indicating an incoming call for the remote

GIBBONS 4-3

10 unit; and

11 reentering the sleep mode of operation when no CONNECT message is

12 received.

1 23. The method according to claim 22, further comprising the step of synchronizing
2 the remote unit to a TDD timing structure before the step of entering the standby mode of
3 operation.

1 24. The method according to claim 23, wherein the predetermined period of time is
2 a predetermined number of subframes after a boundary subframe of the TDD timing structure.

1 25. The method according to claim 24, wherein the predetermined number of
2 subframes is based on an identification number of the remote unit.